A

NEW SECURITY

FOR

PROTECTING BANK NOTES

FROM ALTERATIONS

AND

PHOTOGRAPHIC COUNTERFEITS,

BY THE USE OF

THE PATENT GREEN TINT

CONJOINTLY WITH

BLACK CARBON INK,

AS PRINTED BY

RAWDON, WRIGHT, HATCH & EDSON,

BANK NOTE ENGRAVERS,

NEW-YORK.

◆

W. H. ARTHUR & CO.,
NEW-YORK.
1858.

A NEW SECURITY FOR PROTECTING BANK NOTES FROM ALTERATIONS AND PHOTOGRAPHIC COUNTERFEITS, BY THE USE OF THE PATENT GREEN TINT CONJOINTLY WITH BLACK CARBON INK,

AS PRINTED BY

RAWDON, WRIGHT, HATCH & EDSON,

BANK NOTE ENGRAVERS,

NEW-YORK.

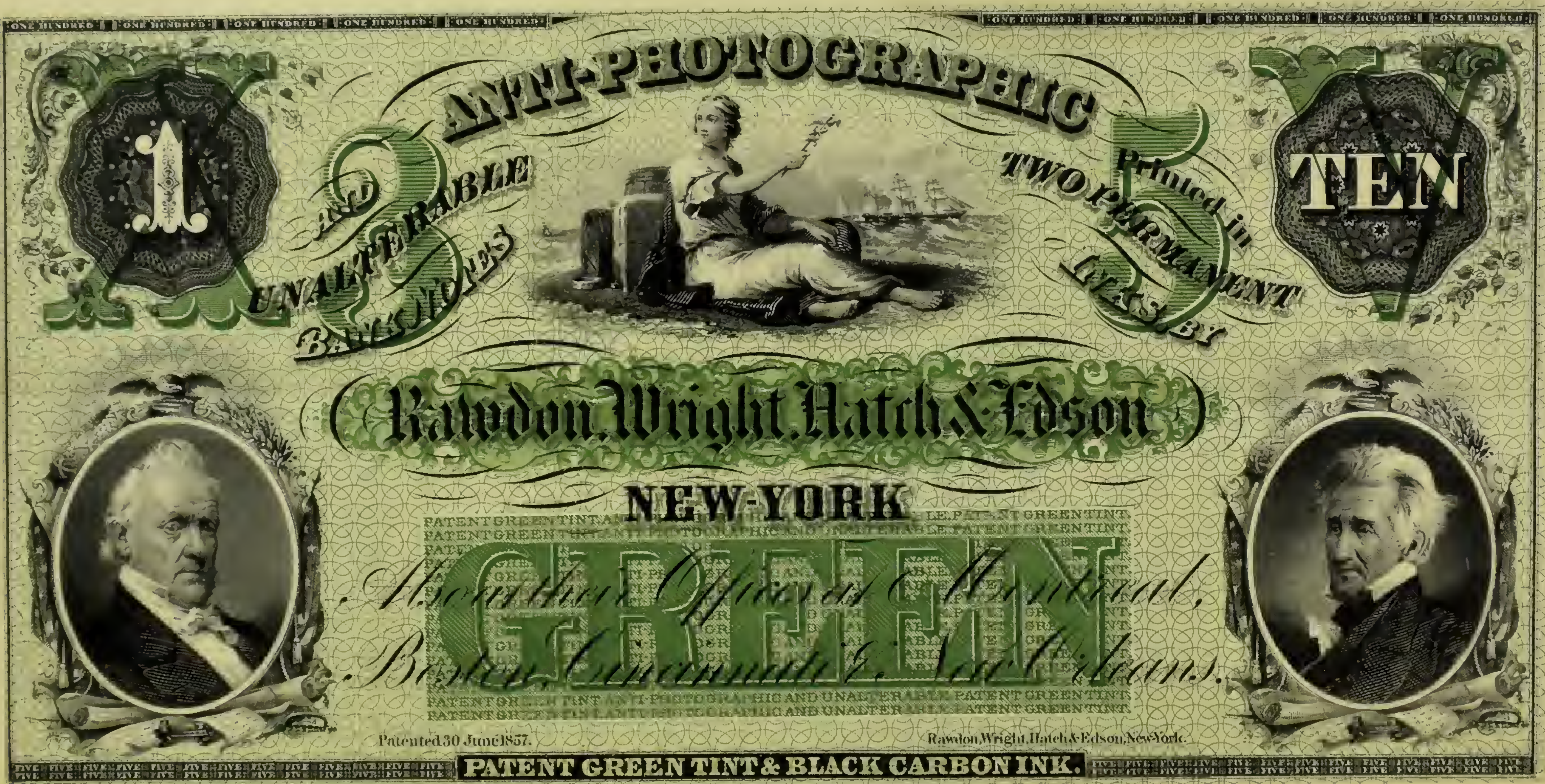
W. H. ARTHUR & CO.,
NEW-YORK.

1858.

Entered according to Act of Congress, in the year 1858,

By TRACY R. EDSON,

In the Clerk's Office of the District Court of the United States for the Southern District of New-York.



ANTI-PHOTOGRAPHIC

AND UNALTERABLE BANK NOTES

Printed in TWO PERMANENT INKS, BY

Rawdon, Wright, Hatch & Edson

NEW-YORK

GREEN

Also at their Offices at Montreal, Boston, Cincinnati & New Orleans.

Patented 30 June 1857.

Rawdon, Wright, Hatch & Edson, New-York.

PATENT GREEN TINT & BLACK CARBON INK.

1
TEN
ONE HUNDRED
FIVE
PATENT GREEN TINT ANTI-PHOTOGRAPHIC AND UNALTERABLE PATENT GREEN TINT

CONTENTS.

PAGE.

Introduction, ... 5

Letter from the President of the City Bank, Montreal, to Professor T. Sterry Hunt, ... 9

Professor Hunt's Reply, ... 9

Letter to Dr. John Torrey, ... 11

Dr. Torrey's Reply, ... 12

Letter from Professor B. Silliman, Jr., ... 12

Letter from Professor Wolcott Gibbs, ... 14

Letter from Professor Horsford, ... 15

Letter from Professor Joseph Henry, ... 15

Letter from Professor Hilgard, ... 16

Letter from George D. Lyman, Esq., ... 17

Letter from Charles D. Fredricks, ... 19

Letter from B. Hufnagel, ... 20

TO THE

BANKING INSTITUTIONS

OF THE

UNITED STATES.

In consequence of the great danger to our paper currency from successful counterfeits, made by photography and kindred processes, it has become evident that a NEW SECURITY is needed, which, while it shall perfectly protect our bank notes from photographic imitations, and from alterations in their denominational value, shall, at the same time, preserve that security which is always afforded by artistic and highly finished engraving.

The undersigned beg leave respectfully to announce to the Banking Institutions of the United States, that they have carefully investigated this subject, and that they are now prepared to furnish the most perfect possible protection against all the above descriptions of fraud.

The process consists in the use of TWO PERMANENT INKS, conjointly, in printing bank notes, and other documents representing value. One of these is the ordinary BLACK bank note printing ink, which, having a basis of carbon, is insoluble and indestructible; the other is an equally insoluble and indestructible GREEN-COLORED INK, which cannot be removed from the paper, without also removing the black ink, and thus destroying the note.

It is an established principle in photographic chemistry, that red, yellow, and green colors act upon photographic plates almost precisely like black; so that lines or figures of these colors will appear black in photographic copies. The use of colors has, therefore, been resorted to as a protection against photographic counterfeiting. Unfortunately, however, all the colored inks heretofore used upon bank notes, for this purpose, as red, yellow, and blue, can be removed with more or less facility, by chemical means, without disturbing the note itself, when printed in the black carbon ink. These colors being removed, the *black* can be copied by photography; and the *colors* being afterwards added by lithography, or otherwise, a COUNTERFEIT is obtained, which is the more dangerous from the fancied security afforded by the colors.

The use of fugitive black or blue inks, printed upon a colored ground, has been resorted to as a protection against photography. But these inks are liable to fade on exposure to light or air; and as it is possible to efface from notes thus printed the black design, by chemical means, without disturbing the red or yellow ground, and to print another in its place, the use of fugitive inks affords great facilities for alterations; while the distinctive characteristics of fine engraving are lost, and the note is rendered easier of imitation by the ordinary counterfeiter, and its detection more difficult.

The use of the BLACK CARBON INK, above referred to, for printing bank notes, conjointly with an equally INSOLUBLE AND INDESTRUCTIBLE COLORED INK, in connection with the highest style of line engraving, would unite, in the greatest degree, the best safeguards against all the various species of fraud to which surety paper is exposed.

A bank note thus printed in TWO PERMANENT INKS, would be protected against the possibility of imitation by photography, and by the lithographic and anastatic processes of copying; while its denominational value could not be altered by any chemical means. Such a note could also be made to unite the security afforded by the highest artistic excellence, against counterfeiting by the engraving process; and the beauty of design and general appearance of the note would be preserved.

The GREEN-COLORED INK, recently patented, has been submitted to the examination of several of our most distinguished chemists, and other gentlemen, who, from their practical experience, are competent to decide a question of this kind. They have subjected it to the most severe tests known to chemical science; and the ink having been pronounced by them to possess the requisite properties, we offer it, with entire confidence, as affording the desired protection when applied in the manner above proposed.

Referring to the accompanying documents, and specimen of printing in the two permanent inks, we are,

Very respectfully,

Your obedient servants,

RAWDON, WRIGHT, HATCH & EDSON.

Letter from WM. WORKMAN, Esq., *President City Bank, Montreal.*

City Bank, Montreal, Canada,
2d March, 1857.

T. STERRY HUNT, Esq., M. A.,
Chemist to the Geological Survey.

SIR :—The attention of the Board of this Institution having been directed to the necessity of some further protection against the possibility of counterfeiting, altering, or photographing bank notes, I beg most respectfully to ask your opinion as to the various tints, colors, and chemical agents, which have been, and are now employed as a means of protection against these frauds.

As your deep research in all that pertains to chemistry, and your high reputation as a chemist, will give to your opinions, on this important subject, a character for reliability which cannot fail to be valuable on public grounds, may I beg the favor of your consideration of this matter at your early convenience ?

Yours, very respectfully,
WILLIAM WORKMAN,
President.

Montreal, July 1st, 1857.

WILLIAM WORKMAN, Esq.,
President of the City Bank.

SIR :—I have, agreeably to your request in your letter of the 2d March, made a series of inquiries relative to the counterfeiting and alteration of bank notes, particularly with reference to the dangers to be apprehended from photography ; and I have now the honor to state the results of my investigation.

The various modes heretofore adopted to render impracticable the copying of notes by photography, are based upon the use, in conjunction with black, of various colored inks; and consist in printing, with one of these colors, a design on the back of the note, or letters, or figures on its face; or, finally, in covering with colored lines the face of the note.

These plans are all ineffectual, from the fact that the colored inks may be effaced by chemical agents. I have convinced myself, by experiment, that all the red and yellow tints hitherto proposed *may be destroyed*, without injury to the paper, or to the ordinary black printing ink, which, having a basis of carbon, is insoluble and indestructible. The blue tints which have been employed are equally fugitive; and, besides, as this color reflects the chemical rays of light, it is valueless as a protection against photographic copying.

Another method has recently been introduced, which consists in covering the paper with a ground of red or yellow color, and then, upon the surface thus prepared, printing the note with a peculiar black ink, of a nature so *fugitive* that it is effaced by any attempt to remove, by chemical agents, the colored ground. Fugitive black inks employed in this way offer a complete protection against photographic copying; but they, at the same time, present great facilities for alteration and render its detection difficult; their use should therefore be rejected.

The only effectual method free from objections is, in my opinion, to be found in the use of a color which shall absorb the chemical rays of light, and be like the black carbon ink, indestructible and indifferent to all chemical agents. A note printed with the ordinary black ink, and having its surface previously tinted with lines of an ink prepared with such a color, will be protected against the possibility of copying by photography, by anastatic printing, lithographic transfer, or kindred processes; while it cannot be altered by any chemical means.

Such a color has hitherto been wanting, but is, in my opinion, now supplied by the *green ink* recently patented by Mr. George Matthews, engraver, of this city, called the "*Canada Bank*

Note Printing Tint." The green pigment which forms the basis of this ink, resists all acids, alkalies, and other agents which can be applied to the paper. It is the most permanent of colors, and as indestructible as the carbon of the ordinary black printing ink.

I have the honor to be, sir,
Your most obedient servant,
T. STERRY HUNT.

New-York, April 21, 1857.

Dr. JOHN TORREY.

DEAR SIR:—We beg leave to hand you herewith specimens of bank notes printed with a GREEN INK recently patented under the name of the "*Canada Bank Note Printing Tint,*" conjointly with the BLACK CARBON INK; and we will thank you to subject the Green Ink to the most searching experiments, to test its character for insolubility and indestructibility.

It is claimed for this ink, that it is unalterable by the action of light, air, or sulphurous vapors; insoluble in nitric, muriatic, or other acids, or in caustic alkalies, and only soluble in boiling oil of vitriol; that, unlike all colors heretofore used for a similar purpose, it resists every known agent which can be employed to dissolve it from the paper, or change its color; and that it can only be effaced by destroying the appearance of the note or document on which it is printed.

Please favor us with the result of your examination, at your earliest convenience, and greatly oblige,

Very respectfully,
Your obedient servants,
RAWDON, WRIGHT, HATCH & EDSON.

Letter from Prof. JOHN TORREY.

New-York, May 5th, 1857.

Messrs. RAWDON, WRIGHT, HATCH & EDSON.

GENTLEMEN :—I have received your communication of the 21st of April last, and have made a careful examination of the Bank Notes, printed with the new GREEN INK, called the *Canada Bank Note Printing Tint,* conjointly with the BLACK CARBON INK. All the tests mentioned in your letter, besides all others known to me, were applied to the Green Ink ; but it resisted every one of them. The green compound is insoluble and indestructible by all chemical agents, except such as will destroy the paper itself. Neither is it possible to change the color. Like all other inks, this may, by mechanical means and with much labor, be removed from the paper; but the black carbon ink will be removed at the same time. I found it was impracticable to efface the one color without obliterating the other.

The invention of this PERMANENT GREEN INK is a very happy one, and the best for the object contemplated that has come to my knowledge. The material which is the basis of the Ink, is the only available indestructible colored body known to me that is suitable for the exceedingly important end you have in view.

Very respectfully,
Your obedient servant,
JOHN TORREY,
Emeritus Professor of Chemistry, College of Physicians and Surgeons, New-York, and Assayer U. S. Assay Office.

Letter from Prof. B. SILLIMAN, Jr.

Yale College Laboratory, June 9th, 1857.

Messrs. RAWDON, WRIGHT, HATCH & EDSON.

GENTLEMEN :—I have, at your request, made a careful examination of the *Green Tinted Bank Notes,* which you have submitted to me, both with reference to the permanence and unalterable nature of the GREEN INK, and also in regard to its anti-photographic power.

The black carbon ink in which black engravings are usually printed, is, as is well known, proof against change of color by any chemical agent, and can be removed from the paper on which it is printed only by mechanical means.

All other colors hitherto employed in bank note printing—as blue, yellow and red—may be removed or changed by chemical means, without injury to the paper on which they are printed. Until the introduction of the GREEN INK, first brought to my notice by yourselves, we were unacquainted with any ink, except black, which could not be removed by chemical means from the surface of the paper on which it had been printed. I have submitted this GREEN INK to the continued and successive action of all the most energetic agents known to chemists, both reducing and oxydizing agents and solvents; and it has withstood them all. This ink is a compound, and theoretically, therefore, it can be decomposed; but this result cannot be attained without the entire destruction of the paper. By mechanical means, aided by the presence of alkalies, it may be removed, but not without also removing the BLACK CARBON INK at the same time.

The anti-photographic power of the GREEN INK is so considerable, that, when properly applied, it will, in my judgment, afford an EFFECTUAL BAR to fraud in this most dangerous direction; as it enables us now, by the use of TWO PERMANENT COLORS, (black and green,) to obtain the best anti-photographic results, which have hitherto been attained only by the use of fugitive colors.

Very respectfully,

B. SILLIMAN, JR.,

Professor of General and Applied
Chemistry in Yale College.

Letter from Prof. WOLCOTT GIBBS.

New-York, June 3d, 1857.

Messrs. RAWDON, WRIGHT, HATCH & EDSON.

GENTLEMEN :—Agreeably to your request I have made a series of careful experiments upon the GREEN INK, submitted by you to my examination, and known as the "*Canada Bank Note Printing Tint.*"

My investigation was conducted with special reference to two points. In the first place, it was necessary to determine whether the green pigment employed could in any manner be changed by the action of chemical agents, so as either to be dissolved or to lose its color. And, secondly, whether the green and black inks, which it is proposed to employ together, are equally indestructible when applied to paper, so that it may not be possible to remove one without affecting the other.

With respect to the first of these two points, there can be no reasonable doubt that the basis of the GREEN INK, when properly prepared, may be considered indestructible and unchangeable; since, as is well known to chemists, and as I have satisfied myself by new and specially devised experiments, it can only be acted on by long boiling with concentrated oil of vitriol, or by fusion with powerfully oxydizing agents. The color moreover is a full and distinct green, which does not fade or bleach on exposure to light; it unites well with oil, and the ink has sufficient body to give the requisite distinctiveness to the designs printed with it.

My experiments have further shown that when the green pigment has been prepared and applied in the manner which you propose, it is not possible to remove it from the paper, without, at the same time, so far removing the black ink, as to render it impossible to obtain even a tolerable photographic copy of the black portions of the note. It must be borne in mind that photographs of a bank note printed in two colors, whether taken by transmitted or reflected light, exhibit but a single color. I am therefore of opinion that your mode of printing with this particular GREEN INK, will afford a good and sufficient security against counterfeiting by photography.

I am, gentlemen, respectfully yours,

WOLCOTT GIBBS,

Professor of Chemistry and Physics in the Free Academy in New-York.

Cambridge, July 31, 1857.

DEAR SIR:—I have carefully tested the bank bills printed in green and black, which you submitted to my inspection.

The basis of the GREEN INK is insoluble in any chemical reagent which will not at once destroy bank note paper. If the GREEN INK be properly prepared, the impression made with it will be as imperishable as that made with black ink; and neither can be removed from a given surface upon which both have been impressed, without at the same time removing the other.

As the green coloring matter intercepts light, it is an obvious protection against photographic copying, since the green and black impressions on the bill will both appear black in the photographic copy.

As both inks will act alike on lithographic stones and zinc plates, the GREEN INK furnishes a manifest protection against both the lithographic and anastatic methods of copying.

I regard the device of GREEN INK as affording increased protection to surety paper.

I am, very respectfully,

Your ob't serv't,

E. N. HORSFORD,

Professor of Chemistry, Harvard University.

TO TRACY R. EDSON, Esq.

Smithsonian Institution, August 4th, 1857.

GENTLEMEN:—Accompanying this we send you a copy of a Report from Dr. Hilgard, relative to the examination of bank notes, which I consider entirely reliable, and trust will be of value in your business operations.

I am, very respectfully,
Your ob't serv't,
JOSEPH HENRY.

Messrs. RAWDON, WRIGHT, HATCH & EDSON, *New-York.*

Smithsonian Institution, August 1st, 1857.

Prof. JOSEPH HENRY.

DEAR SIR:—I have examined the specimens of bank notes printed in green and black, sent by Messrs. Rawdon, Wright, Hatch & Edson, with reference to determining whether or not the use of the GREEN INK, conjointly with the black, offers protection against counterfeiting, and I have arrived at the following results.

The GREEN INK contains a base which, when properly prepared, is insoluble and unalterable under any circumstances, or by any chemical agents not involving the complete destruction of any paper or other organic tissue, so far as known at present.

I find that when this substance is reduced to a proper state of mechanical division, the ink prepared from it will adhere to the paper quite as firmly as the common carbon ink; so that when both inks are jointly used on the same paper, one cannot be removed without the other, by any chemical or mechanical means known. At the same time, the contrast of the two colors is such as not to escape the most casual glance.

When prepared with the same kind of oil, neither of them can be transferred without the other, to either the stone or zinc plate, from a paper surface printed with both; hence it is obvious that, when the two differently colored designs are properly complicated and interlaced, neither the lithographic nor anastatic copying processes can be of any use, except to produce notes of a single tint, which could not deceive any one.

The most important point, however, which is gained by the joint use of these two permanent inks, is the prevention of photographic counterfeiting. For in attempting to photograph one of these notes, both the black and the green design will be reproduced in black only; or, possibly, some other *one* color, but never *two*, so long as the art of photographing objects in their natural colors remains a problem unsolved. In the photographic copy the green part of the design will, indeed, appear somewhat lighter than the black, but the joint use of these two inks cannot but be considered as an improvement highly important and useful, and as affording the best security against counterfeiting (independently of legislation) which has thus far been offered to the public.

Respectfully yours,

EUGENE W. HILGARD.

New-York Clearing-House, Thursday, July 26th, 1857.

Messrs. RAWDON, WRIGHT, HATCH & EDSON.

GENTLEMEN :—The want of some better protection for the security of bank notes from counterfeits and alterations, must have been felt by all bankers who have given the subject attention. While it is admitted that the art of bank note engraving and printing has been brought to greater perfection in this than in any other country, still counterfeits and altered bank notes are constantly put into circulation, and by them both the banks and the public suffer much loss.

The discoveries of modern science have aided the counterfeiter, and enable him to imitate, with much ease, a large class of the bank notes now in circulation, which had been considered perfectly secured. The wonderful art of producing and copying pictures, through the agency of light, by photographic and kindred processes, has recently been so perfected and simplified as to have seriously endangered all paper currency. By cheap, simple, and rapid methods, the most elaborate and highly executed engraving of the artist, the most beautiful bank note, bearing upon its face the imprint of the talent of many artists, exhibited in all the various branches of the engraver's art, and combined in the most skillful and artistic manner, may be faithfully and minutely copied in a few minutes and multiplied to any extent; thus nearly destroying the security which has been afforded by beauty of design, artistic execution, and combined and varied talent. The security of the public against the abuse of this new and beautiful art, has occupied the attention of bank note engravers, and has given them no little trouble. It was for a time thought that printing portions of notes in red or yellow colored ink would protect them. But it was found easy to remove from the face of the note the colored ink without injury to the black ink or the paper. Printing with fugitive inks of different colors, but of like chemical affinities, has been highly recommended as a protection; and some of the plans proposed, based upon the principle of printing with different colored inks, alike fugitive, and which would be removed from the paper by the action of the same chemical reagents, appeared at first to afford entire protection. The best of these plans does make counterfeiting by photographic, anastatic, or lithographic processes nearly, if not quite, impossible; but the use of all fugitive inks rather facilitates the alteration of notes, through the ease with which they are removed; nor do they wear well, the impression soon becoming blurred and indistinct. The fugitive inks that I have seen appear to want body, and do not give as clear, strong impressions as the inks commonly used, which are much more permanent and durable.

After a careful examination of all the protections yet proposed, I am satisfied that the green tint, introduced by your house, and used upon your patent anti-photographic bank notes, is much the best yet discovered. In the specimens I have examined, you have printed with the GREEN INK, a pleasing and laborate tint upon the face of the note, in which you have effectually introduced securities against alteration, and upon which you have printed the note proper with the black carbon ink commonly used, and which is known, by long experience, to give the best impression from the engraved plate, and to wear as long as the paper upon which it is printed. I am convinced by the experiments that I have made and witnessed, that it is impossible to remove the green tint without also removing the black ink, or destroying the paper, and that the GREEN INK is as durable and permanent as is the black. The only photographic copy that could be obtained from notes thus secured, would be an indistinct and confused copy in a single color, which could not be mistaken for a bank note; and any attempt to copy them by the anastatic or lithographic process would prove abortive for the same reasons. I have no hesitation in recommending your patent green tint bank note protection, as well worthy of the attention of bank officers.

Respectfully yours,

GEO. D. LYMAN.

Letter from CHARLES D. FREDRICKS, *Photographer.*

No. 585 *Broadway, New-York, May* 29*th,* 1857.

Messrs. RAWDON, WRIGHT, HATCH & EDSON.

GENTLEMEN:—Agreeably to your request I have made numerous experiments, by various processes, upon the green-tinted bank notes submitted by you, for the purpose of determining the ANTI-PHOTOGRAPHIC POWER OF THE GREEN INK in which they were printed.

The result is that, in all cases, the portions printed in GREEN, as well as those printed in black, appear only in BLACK in the photographic copy. And I do not hesitate to say, that it is impossible to make a counterfeit by photography of any bank note upon which this green tint is printed by you, in connection with the black ink ordinarily used in printing bank notes.

Respectfully, your ob't serv't,

C. D. FREDRICKS.

We, the undersigned, have assisted in making the experiments referred to, and fully concur in the opinion above expressed.

G. Penabert,
Victor Piard,
Photographic Operators for Mr. Fredricks.

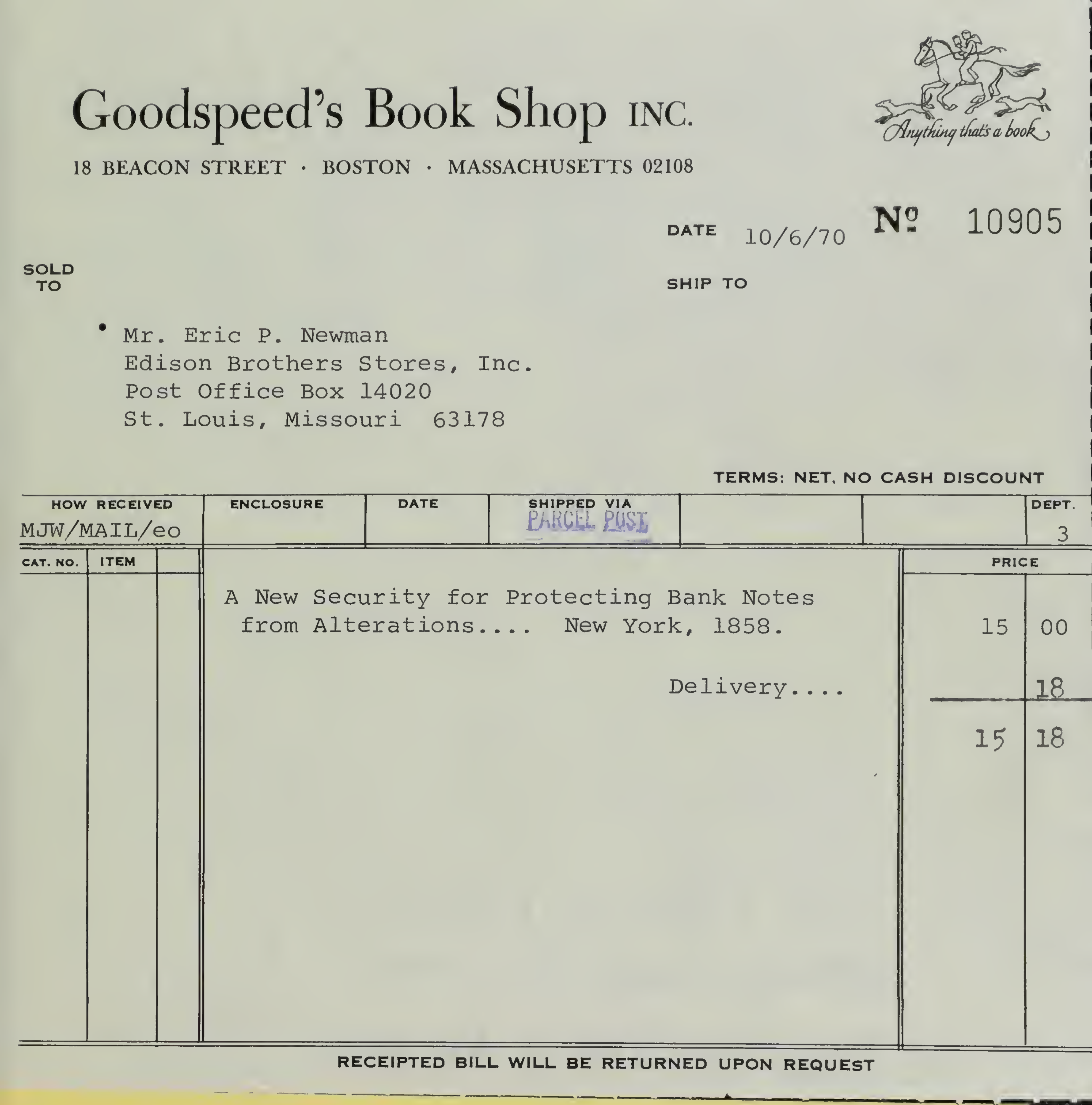
New-York, 15*th Jan'y*, 1858.

Tracy R. Edson, Esq.

Dear Sir :—I have made many experiments photographically, upon bank notes, printed in the Patent Green Tint, combined with the ordinary black printing ink, and in *every instance*, the parts printed in the green colored ink appear black in the photographic copy.

I have found it impossible to make a photographic copy of notes printed in that manner, that will exhibit more than one shade of color, and from my knowledge of the principles of photographic chemistry, I do not believe there is any process known by which it can be done.

B. Hufnagel,
Photographer, 413 *Broadway*, *N. Y.*



Goodspeed's Book Shop INC.

18 BEACON STREET · BOSTON · MASSACHUSETTS 02108

Anything that's a book

DATE 10/6/70 **Nº** 10905

SOLD TO

SHIP TO

Mr. Eric P. Newman
Edison Brothers Stores, Inc.
Post Office Box 14020
St. Louis, Missouri 63178

TERMS: NET, NO CASH DISCOUNT

HOW RECEIVED	ENCLOSURE	DATE	SHIPPED VIA			DEPT.
MJW/MAIL/eo			PARCEL POST			3

CAT. NO.	ITEM			PRICE	
			A New Security for Protecting Bank Notes from Alterations.... New York, 1858.	15	00
			Delivery....		18
				15	18

RECEIPTED BILL WILL BE RETURNED UPON REQUEST

The existence of photographic counterfeits of bank notes resulted in the invention of a security green ink which could not then be photographed clearly. Photography quickly improved, making this protection obsolete.